SRT 306 Operational Description

Contents

General Description

SRT 306 is a highly configurable and mobile alarm unit with a variety of alarm options.

It is configurable through SMS, and can use both SMS and GPRS to deliver alarms and reports in various report formats.

In its standard configuration, it includes GPS, Alarm Button, Call Button, Timer Button, Vibration Sensor, Vibrator, Microphone and Speaker.

GSM Working Modes

Depending on configuration, the SRT 306 can be in one of several modes when the unit is enabled (on-off switch set to on);

- GSM Always On
- GSM Forced On
- GSM Normally Off
- GSM Timer Mode
- No GSM Mode

If the SRT 306 is disabled (on-off switch set to off) all alarm functions are disabled.

If the SRT 306 is switched off, already detected alarms will be processed before turning off.

If the SRT 306 detects a battery voltage below 3.3V during an unsuccessful GSM attach procedure, the unit will be put into the No GSM Mode.

GSM Always On

This mode applies if the on-off switch is set to on and the *GSM On Time* is set to 000 (parameter ONT in #C1). In this case, the GSM engine is always on, all alarm functions operates in accordance to the current configuration.

GSM Forced On

This mode applies if the on-off switch is set to on and the *Charger Mode* mask is set to include *Charger On Mode* (parameter CHG in #C1). The GSM engine will stay on as long as the charger is connected.

GSM Normally Off

This mode applies if the on-off switch is set to on and the *GSM On Time* has a non-zero value, and the *GSM Off Time* is set to 000. In this case, the GSM engine is turned on automatically after a power-up reset or off-to-on transition of the on-off switch, and stays on for the time period defined. Thereafter the GSM engine is normally off.

All hardware based alarms are still active according to the current configuration, and if an alarm should turn on the GSM again, it will be on for the time period defined, unless otherwise specified.

GSM Timer Mode

This mode applies if the on-off switch is set to on and both the *GSM On Time* and the *GSM Off Time* have non-zero values. In this case, the GSM engine is turned on automatically after a power-up reset or off-to-on transition of the on-off switch, and stays on for the time period defined. Thereafter the GSM engine is turned off, but will be turned on again either due to alarm events or due to the *GSM Off Time* timer expiring.

Note: The timers that control *GSM On Time* and *GSM Off Time* always start at the same time. This means that the *GSM Off Time* has to be set to a time higher than the GSM On time to be of practical use.

Example: *GSM On Time* set to 10 minutes, *GSM Off Time* set to 2 hours, will cause the GSM to be on for 10 minutes and off for 1 hour and 50 minutes, for a total cycle length of 2 hours.

No GSM Mode

This mode is entered when the unit detects that the battery level is too low at the same time as the unit can't register on the GSM network. To clear this mode, the battery level must be detected to be at 3.85V or higher for duration of 15 minutes.

Alarms that are detected, but not sent, prior to entering No GSM Mode will be sent once the unit clears the No GSM Mode.

Alarm detection during No GSM Mode is not supported.

GPS Working Modes

The built in GPS unit can be used in several modes to provide position data in alarms and reports.

- GPS On While GSM On
- GPS Always On
- GPS Normally Off

In addition to the working modes, the unit can use two different power savings modes that when configured, applies to all working modes.

- Dynamic Power Savings
- Timer Controlled Power Savings

GPS On While GSM On

This mode applies when the *GPS Mode* is set to 1 (parameter GPS in #C1). The GPS will be turned on together with the GSM, and position data can be included in alarms and reports.

When the GSM is turned off, the GPS will be turned off as well.

GPS Always On

This mode applies when the *GPS Mode* is set to 2. It works just like when GPS Mode is set to 1, but the GPS will be kept on even when the GSM is turned off for any reason except an on-to-off transition of the on-off switch.

GPS Normally Off

This mode applies when the *GPS Mode* is set to 0. Under normal operations the GPS is normally off.

If the unit is configured for cell tracking alarms the GPS can be temporarily turned on in conjunction with a *Cell Tracking Alarm Event* to provide a follow-up report including position data. If the GPS doesn't lock on to a new position within 3 minutes of the *Cell Tracking Alarm Event*, no additional report will be sent. This temporary GPS on mode is controlled by parameter CTG in #C1.

GPS Power Savings Modes

This mode is controlled primarily by the *GPS Sleep Mode* parameter (GPM in #C1 or #C32). If this is set to 0, no power savings will be used. If set to 1, Mode 1 (Dynamic) power savings will be used. If set to 2, Mode 2 (Timer Controlled) power savings will be used.

Two of the parameters in #C32 (*Alarm Delay Time* – GPD and *Sleep Mode Prevention Time* – GPP) can be used in all modes. The first delays alarm sending by up to 99 seconds to let the GPS collect new position data, while the second prevents power savings for up to 999 seconds after an alarm.

Mode 1 (Dynamic)

In this mode, for the GPS to enter sleep mode the following conditions has to be fulfilled.

Number of fix positions in a row equals or exceeds the number configured with parameter GPX.

Assuming first condition is fulfilled; either the number of satellites used by the GPS to calculate the current fix position must equal or exceed the number configured with parameter GPN or the number of fix positions in a row reaches the number configured with parameter GPY.

The speed with which the unit is travelling must be lower than the value configured with GPV.

If periodic or distance reports are enabled, the estimated time to next report is greater than the sum of parameters GPT and GPZ.

Mode 2 (Timer Controlled)

In this mode, the GPS will enter sleep mode periodically according to the *GPS Sleep Time* and *GPS Wake Time* parameters. Under normal operation the GPS will be on for the number of minutes defined by GPW, and will be off for the number of minutes defined by GPH.

If an alarm occurs, the cycle is reset and the GPS will begin by being on for GPW minutes again.

Events

Alarm Events

Alarm events can be grouped into events that may turn the SRT 306 on while it is enabled, but is in off mode, and events that require the unit to be on to be generated.

The sensors that may trigger an alarm event and turn on the SRT 306 while it is enabled, but in off mode are;

- Alarm Button
- Vibration sensor
- Timer Button (Timer Alarm)
- Charger detector
- Low Battery

Additional alarm events when the SRT 306 is on include;

- Cell Tracking
- Geo Fencing
- SIM Card Change
- Configuration Change

The SRT 306 may also be turned on if the Call Button is configured to make a Call Button Call and the button is pressed while the unit is in off mode, but this doesn't count as an alarm event.

Alarms can be detected and processed even when the unit has a voice call set up, provided it is not an alarm call.

Alarm Calls

Outgoing Alarm Calls

After an alarm event has been detected, a report will be sent to the defined receivers (if any), and the unit may then proceed to make an alarm call.

Up to three numbers can be defined as alarm call receivers, and each number will be tried in turn.

If one receiver is busy, the next will be tried right away and otherwise wait 15-99 seconds for the call to be answered.

If an alarm call is answered, another report may be sent to the receivers to indicate which number answered the call.

If none of the receivers answer, a defined number of attempts will be made, but if there is no answer during any of these attempts, another report will be sent to indicate that no one answered the call.

There is also the possibility to require that an alarm call is acknowledged when answered. This is done by defining a sequence of up to three DTMF digits that the receiver has to send to the unit

within 15 to 99 seconds of the connected call. The unit will indicate to the receiver that it expects a DTMF sequence by sending either the DTMF tone A or B. A receiver is expected to handle both A or B, even if B is only used if the expected reply sequence begins with an A.

If a voice call is already set up (incoming call, normal outgoing call or call-button call) when the alarm call should be made, the currently ongoing voice call will be disconnected.

The alarm events that may trigger an alarm call are;

- Pushbutton Alarm Event
- Vibration Sensor Alarm Event
- Timer Alarm Event
- Low Battery Alarm Event
- Cell Tracking Alarm Event

Incoming Alarm Calls

Same alarm events that are available to trigger an outgoing alarm call are also able to be configured to wait for an incoming call and process the received call as an alarm call.

During this period GPRS reporting is not allowed and any active GPRS connection is closed. Any incoming call is answered instantaneously as long as number of the dialler is allowed to access the unit, in other words, it is included in voice access numbers list (#C3).

Call Button Calls

After a call button call event has been detected, the unit will make an attempt to call a configured number. Only one number can be designated as the number to be called upon a call button call event. If the receiver is busy, the unit will cancel the call attempt.

The unit can be configured to allow local hang-up by pressing the call button again or to require that the remote party ends the call.

If a voice call is already set up (incoming call or normal outgoing call) when the call button call should be made, the currently ongoing voice call will be disconnected.

Other Incoming or Outgoing Calls

When a call is made to the unit, the unit will check if voice access is restricted or if anyone is allowed to make a call. If unit is configured to alert the incoming call either by sound or vibration, while alerting the incoming call via preferred alert type, it waits for user input (call button press) to connect the call. Otherwise it proceeds to answer the incoming call straight away.

It is also possible to send a command to the unit which tells the unit to make a call to a number specified in the command. This command is only accepted if there is no other voice calls ongoing.

Periodic Events

The unit may be configured to send reports periodically. Periodic reporting can be time based, distance based or time and distance based.

If both time based and distance based periodic reporting is enabled, whichever event happens first will reset both the time counter and the distance counter that are used to generate the periodic events.

Vibration Activation

An alarm event may also trigger vibrations after successful sending of report, when an alarm call is answered or after the alarm call has finished. Combinations of the three are possible.

The alarm events that may trigger these vibrations are;

- Pushbutton Alarm Event
- Timer Alarm Event
- Low Battery Alarm Event
- Cell Tracking Alarm Event

Vibrations may also be triggered for each received SMS or each received and connected incoming voice call or a combination of both.

When any of these vibrations are enabled, and the Vibration Sensor alarm is configured for mode 1, 2 or 3, the Vibration Sensor alarm will be disabled. If the Vibration Sensor alarm is configured for mode 4, no change will be made.

Likewise, when Vibration Sensor alarm is configured for mode 1, 2 or 3, all of these vibrations will be disabled. If the Vibration Sensor alarm is configured for mode 4, no change will be made.

Start & Stop

The unit may be configured to send a report when it starts, either from enabling the unit, or from starting in GSM Timer Mode, and to send a report when it stops, either from disabling the unit, or from it going into off mode automatically. These can be configured independently of each other.

Start & Stop

Configuration

The main method of configuring SRT 306 is through SMS, but it is also possible to configure the unit through the TCP Command Channel after the unit has been set up for TCP Command Channel usage.

Most of the commands accepted by SRT 306 are described in the document SRT# Command Specification. In addition there is a set of commands called Clear Text Commands, which are described in the document 306 Software Specification - Clear Text Commands.

Responses to commands sent over SMS will be sent over SMS to the sender of the command, unless otherwise specified in the command. Requesting that the response be sent over GPRS is not supported.

Responses to commands sent over the TCP Command Channel will be sent over the TCP Command Channel unless otherwise specified in the command.

Report Sending

SMS and TCP/UDP

By default, SRT 306 sends all regular and alarm reports over SMS to the SMS receivers defined with command #C2. These will be mentioned in this document as *SMS Receiver 1*, *SMS Receiver 2* and *SMS Receiver 3*.

In addition to these, there is also *Low Battery Alarm Number*, *SIM Card Change Alarm Number* and *Master Number*, which corresponds to specific events.

If no *Low Battery Alarm Number* is defined, the corresponding alarm report will instead be sent to *Alarm Number 1* through *3*.

It is possible to configure the unit to send the reports using TCP or UDP over GPRS as well. For this purpose, up to three IP receivers can be defined with command #C20. These will be mentioned in this document as *IP Receiver 1*, *IP Receiver 2* and *IP Receiver 3*, and correspond to *SMS Receiver 1* through *3*.

The parameter *Reporting Mode Configuration*, settable in either #C1 or #C24, controls how the reports should be sent; SMS only, TCP or UDP only, SMS and TCP or UDP, TCP or UDP with fallback to SMS. If no *IP Receiver* has been defined, SMS only will be enforced for all three receivers, and if only one or two *IP Receivers* are defined, SMS only will be enforced for the remaining receivers.

The parameter *TCP/UDP Selection* in #C24 controls whether to use TCP or UDP when sending the reports over GPRS.

For reports that are sent over GPRS it is possible to require that the receiving server sends an acknowledge message to the unit to indicate that it received the report. See command #C24 for information on the parameters that control this behaviour.

In case reports sent over UDP are configured to be acknowledged from the receiving server, then the server must reply from its receiving port to the unit's sending source port. Otherwise replied acknowledge messages will not be able to reach the unit.

TCP Command Channel

When the TCP Command Channel has been set up and been enabled, the unit will default to establishing a connection to a server through which reports can be sent, or configuration commands be received.

Upon establishing the connection to the server (using TCP), the unit will begin with sending a message containing the unit IMEI number as well as the IMSI number of the SIM card that is in use. This message looks like: **IMEI:<IMEI number> IMSI:<IMSI number><CR><LF>**

Commands sent from the server will be accepted and checked for validity upon reception of a carriage return, line feed or semicolon character immediately after the command itself.

The IP number of the server is set with command #C26 and other relevant settings can be found in command #C25.

GPRS APN

To be able to use IP Receivers or the TCP Command Channel, GPRS APN information must be supplied to the unit. This is done with the commands #C21, #C22 and #C23.

Some operators do not require the use of User Name and Password, and some operators may not need the Access Point Name either, though it is recommended that at least the Access Point Name is defined.

Functions

This section describes the various hardware and software sensors that are used to trigger alarm events, report events, alarm call events, call button call events and other call events.

Alarm Button

The alarm button can generate a *pushbutton alarm event*.

Pushbutton Alarm Event

The alarm event is generated when the alarm button is pressed and held for the time defined by the *Pushbutton Alarm Detection Time* parameter.

The time needed to press and hold the alarm button is defined by the *Pushbutton Alarm Detection Time parameter*, in seconds minus one. If the parameter has a value of 0, the alarm button is disabled. For values of 1 to 9, the detection time is that value minus one, so 1 means immediate detection and 9 means 8 seconds detection time.

After the *pushbutton alarm event* has been processed, a new *pushbutton alarm event* can be generated either immediately, or after a time defined by the *Pushbutton Alarm Idle Time* parameter, in minutes. If the idle time is set to 0, a new *pushbutton alarm event* can be generated immediately. The idle time can be as long as 999 minutes.

Upon detecting that the alarm button has been pressed and held for the configured time, the unit will indicate this with a short (0.3 second) vibration. It is not possible to configure this vibration time or turn it off.

If the parameter *Alarm Call for Pushbutton Alarm* has been set to 1, the unit will attempt to make an alarm call after the alarm report has been sent. See **Alarm Call** for more information about alarm calls.

The alarm button supports vibrator activation through the *Vibrator Activation for Pushbutton Alarm* parameter. See **Vibrator Activation** for more information about vibrator activation.

See **Report Formats** for information about what report formats are supported for pushbutton alarm events.

Parameters	Command Number	Description
ADT	#C1,#C10	Pushbutton Alarm Detection Time
AIT	#C1,#C10	Pushbutton Alarm Idle Time
VPB	#C11	Vibrator Activation for Pushbutton Alarm
CPB	#C11	Alarm Call for Pushbutton Alarm

Call Button

The call button is used to answer an incoming call or to generate a *call button call event.*

Call Button Call Event

The event is triggered when the unit detects that the call button has been pressed and held for a configurable time. The unit will then proceed to make an attempt at setting up a voice call to a configured number. Hang-up of a call that is answered can be done in three ways; the user press the call button again, the remote side hangs up or an alarm is generated during the call for which an alarm call has to be set up.

The microphone and speaker can be enabled or disabled for this call type separately from the other call types.

With the *Call Button Mode* parameter, the call button can be disabled or be put into one of two modes. The first mode allows the user to hang up by pressing the button again, while the second mode requires that the remote side hangs up or an alarm is generated for which an alarm call has to be set up.

With the *Call Button Detection Time* parameter, the call button can be configured to generate the event immediately when pressed, or after the call button has been pressed and held for up to 9 seconds.

With the *Call Button Microphone Mode* parameter, the microphone can be configured to be enabled or disabled during the call button call.

With the *Call Button Speaker Mode* parameter, the speaker can be configured to be enabled or disabled during the call button call.

With the *Call Alert Type* parameter, the unit can be configured to alert normal incoming calls by sound, vibration or both only if *Call Button Mode* parameter is set to 1 or 2. If *CAT* parameter is disabled incoming calls will be answered right away as usual. If *Call Button Mode* parameter is set to 2 call button may also be used to hang up a preceding call in progress.

The number that should be called upon a call button call event is defined by the *Call Button Number* parameter.

Parameters	Command Number	Description
CBM	#C40	Call Button Mode
CRM	#C40	Dedicated Call Button Mode
CBD	#C40	Call Button Detection Time
CMI	#C40	Call Button Microphone Mode
CSP	#C40	Call Button Speaker Mode
CAT	#C40	Call Alert Type
	#C41	Call Button Number

Timer Button

The timer button is used to generate a *timer alarm event.*

Timer Alarm Event

Timer Button can be used to generate a timer alarm (even called as passivity alarm).

If this mode enabled, it is activated by pressing Timer Button at least for a duration of *Call Button Detection Time* plus five seconds. The GSM indicator will flash quickly to indicate that the timer alarm mode is activated. The deactivation of timer alarm mode can be done in one of three ways: a) by pressing Timer Button at least for the duration of *Call Button Detection Time* plus five seconds, b) by setting the unit off using on-off switch, c) by connecting a charger to the unit if the selected timer alarm mode configuration requires this.

While timer alarm mode is activated, the user requires pressing Timer Button regularly to prevent that an alarm situation occurs. In this case the detection time is given by *Call Button Detection Time*. Each time Timer Button is pressed, the unit will vibrate shortly to indicate that Timer Button is pressed. The maximum time period allowed between two Timer Button detections is defined by *Passivity Alarm Idle Time*. If no Timer Button detection occurs after the time period given by *Passivity Alarm Idle Time* minus *Passivity Alarm Delay Time* the user will be alerted as configured by *Passivity Alarm Alert Generator.* Alerting will go on for the time period given by *Passivity Alarm Delay Time*. If no Timer Button detection occurs during alerting, a timer alarm will be generated.

Parameters	Command Number	Description
CBM	#C40	Call Button Mode
TRM	#C40	Dedicated Timer Button Mode
CBD	#C40	Call Button Detection Time
PSI	#C40	Passivity Alarm Idle Time
PSD	#C40	Passivity Alarm Delay time
PSA	#C40	Passivity Alarm Alert Generator
PSZ	#C40	Passivity Alarm Disable after alarm

On/Off Switch

On/off switch is basically used to turn on/off the device. There are two functionality of on/off switch. First one is the normal usage of the switch so it is used to turn on/off the device as simple. Second one is disabling the transmission between on and off state. While unit is configured as the second case, it is just possible to turn on the device once and start it. After starting the unit changing the state of on/off switch will have no effect and unit will stay on.

Parameters	Command Number	Description
OOT	#C10	On Off Transmission

Vibration Sensor

The vibration sensor can generate three different events depending on the configuration parameters. These events are; *vibration sensor alarm*, *vibration sensor force GSM on with single alarm*, and *vibration sensor force GSM on with no alarm*.

Vibration Sensor Alarm Event

The vibration sensor can be configured to generate this event in two ways; on vibration detected and on no-vibration detected.

On Vibration Detected

This mode is selected by setting the *Vibration Sensor Alarm Mode* parameter to 1.

The alarm event is generated when vibrations are detected, which can be either immediately upon vibration or after the vibrations has been going on for a set time.

After the *vibration sensor alarm event* has been processed, a new *vibration sensor alarm event* can be generated either immediately, or after a time defined by the *Vibration Sensor Alarm Idle Time* parameter, in minutes. If the idle time is set to 0, a new vibration sensor alarm event can be generated immediately. The idle time can be as long as 999 minutes.

On No-Vibration Detected

This mode is selected by setting the *Vibration Sensor Alarm Mode* parameter to 2.

The alarm event is generated when no-vibration is detected. In this case, the *Vibration Sensor Alarm Idle Time* parameter is used to define the time needed during which no vibration may occur to generate this alarm event. If the idle time is set to 0, the vibration sensor will be disabled.

After the *vibration sensor alarm event* has been processed, a new *vibration sensor alarm event* can be generated. In this case, the vibration sensor must detect new vibrations in order to detect a new no-vibration condition.

Vibration Sensor Force GSM on with Single Alarm Event

This mode is selected by setting the *Vibration Sensor Alarm Mode* parameter to 3.

When vibrations are detected, either immediately upon vibration or after the vibrations has been going on for a set time, the unit will enter a Forced On state. To clear this state, either the unit has to be turned off, or no vibrations are detected during the time period defined by the *Vibration Sensor Alarm Idle Time* parameter.

Upon entering this Forced On state, an alarm report will be sent and alarm call will be made, after which no more alarm reports are sent for this event instance. For a new alarm event to be generated, the Forced On state must be cleared.

Vibration Sensor Force GSM on with No Alarm Event

This mode is selected by setting the *Vibration Sensor Alarm Mode* parameter to 4, and works exactly as the previous mode with the difference that no alarm report will be sent and no alarm call will be made.

For the modes that generate event on vibration detection, a detection time may be configured for either immediate detection or continuous vibration for up to two minutes. If a minimum detection time is defined, a vibration is treated as continuous as long as the time between two real vibrations is not 10 seconds or longer. The shortest possible detection time, other than immediate detection, is 21 seconds. The *Vibration Sensor Alarm Detection Time* parameter can be set to between 00 and 99, and if this value is non-zero, the actual detection time is offset by +20 seconds from the value defined.

If the *Vibration Sensor Alarm Mode* parameter is set to 1, 2, or 3, the vibrator settings for vibration after alarm report sent, alarm call answer or finish, and for incoming events will be cleared. Likewise, if the vibrator settings are set, the *Vibration Sensor Alarm Mode* parameter will be cleared if it is set to 1, 2 or 3.

If the parameter *Alarm Call for Vibration Sensor Alarm* has been set to 1, the unit will attempt to make an alarm call after the alarm report has been sent. See **Alarm Call** for more information about alarm calls.

See **Report Formats** for information about what report formats are supported for vibration sensor alarm events.

Parameters	Command Number	Description
VAM	#C10	Vibration Sensor Alarm Mode
VAI	#C10	Vibration Sensor Alarm Idle Time
VAD	#C10	Vibration Sensor Alarm Detection Time
CVS	#C11	Alarm Call for Vibration Sensor Alarm

Charger Detector

The charger detector can generate one alarm event and two control events that control the GSM in two ways. The event is; charge-off alarm event. The control events are; keep GSM on while charger is connected and keep GSM on in case of GSM registration failure.

Keep GSM on while Charger is Connected

This mode is selected by setting the *Charger Detector Mode* parameter to 1.

In this mode the GSM will be in a forced on state for as long as a charger is connected to the unit. This assumes normal operation and does not prevent restart due to no GSM registration or GSM registration failure.

Keep GSM on in case of GSM Registration Failure

This mode is selected by setting the *Charger Detector Mode* parameter to 2.

If the GSM wants to restart due to no GSM registration, or due to GSM registration failure, this parameter can be used to keep the GSM on even if it is not registered on the GSM network.

Charge-off Alarm Event

This mode is selected by setting the *Charger Detector Mode* parameter to 4.

When this mode is enabled, removal of the charger triggers a charge-off alarm event. An alarm report will be sent to normal configured report receivers.

Parameters	Command Number	Description
CHG	#C1	Charger Detector Mode

Low Battery

The battery level sensor can generate the low battery alarm event.

Low Battery Alarm Event

The battery level sensor automatically generates this event when the battery level is detected to be 3.65V for a certain time.

After the low battery alarm event has been processed, a new low battery alarm event cannot be generated until the battery level has been detected to be over 3.85V for a certain time.

If the *Low Battery Alarm Number* parameter is defined, the alarm report will be sent to that number using the format defined by parameter *Report Format for Low Battery Alarm*; otherwise the alarm report will be sent to the regular report receivers.

If the *Low Battery Sound Indicator* parameter has been set to 1, the unit will emit a 0.3 seconds long audio pulse with a frequency of 1700Hz.

If the parameter *Alarm Call for Low Battery Alarm* has been set to 1, the unit will attempt to make an alarm call after the alarm report has been sent. See **Alarm Call** for more information about alarm calls.

The battery level sensor supports vibrator activation through the *Vibrator Activation for Low Battery Alarm* parameter. See **Vibrator Activation** for more information about vibrator activation.

See **Report Formats** for information about what report formats are supported for low battery alarm events.

Parameters	Command Number	Description
LBS	#C10	Low Battery Sound Indicator
VLB	#C11	Vibrator Activation for Low Battery Alarm
CLB	#C11	Alarm Call for Low Battery Alarm
LBN	#C16	Report Format for Low Battery Alarm
	#C98	Low Battery Alarm Number

Cell Tracking

Using basic information about which GSM network cells the unit is connected to, a cell tracking alarm event can be generated.

Cell Tracking Alarm Event

When the *Cell Tracking Mode* parameter is received with a value between 1 and 4, the unit builds a reference position using the MCC, MNC, LAC and CI parameters provided by the GSM cells.

For modes 1 and 3, the reference position is built using only the main cell that the unit is registered to, while modes 2 and 4 uses information from both main cell and neighbouring cells. For all of these four modes, it is necessary that the main cell information is complete; otherwise the function will not be activated.

When the reference position is completed, the function will be activated immediately for mode 1 and 2, and after the time period defined by the *Cell Tracking Time Delay* parameter for mode 3 and 4.

When the *Cell Tracking Mode* parameter is received with a value of 5 or 6, it is required that a reference position is already defined, either from previously using mode 1 through 4, or by setting the cell reference manually with the *Cell Reference* parameter. Similar to the previous modes, mode 5 is activated immediately while mode 6 is activated after the time period defined by the *Cell Tracking Time Delay* parameter.

Main Cell Tracking – Alarm if Outside Permitted Cell

This mode is selected by setting the *Cell Tracking Mode* parameter to 1.

While this mode is active, the unit will continuously check which main cell is currently in use. If it is different from the reference cell, the cell tracking alarm event will be generated.

Cell Environment Tracking – Alarm if Outside Permitted Area

This mode is selected by setting the *Cell Tracking Mode* parameter to 2.

While this mode is active, the unit will continuously check which main cell and neighbouring cells are used. If the main cell is not among the reference cells and the reference main cell is not one of the current neighbouring cells, the cell tracking alarm event will be generated.

Main Cell Tracking – Alarm if Inside Forbidden Cell

This mode is selected by setting the *Cell Tracking Mode* parameter to 3.

While this mode is active, the unit will continuously check which main cell is currently in use. If it is the same as the reference cell, the cell tracking alarm event will be generated.

Cell Environment Tracking – Alarm if Inside Forbidden Area

This mode is selected by setting the *Cell Tracking Mode* parameter to 4.

While this mode is active, the unit will continuously check which main cell and neighbouring cells are used. If the main cell is among the reference cells or the reference main cell is one of the current neighbouring cells, the cell tracking alarm event will be generated.

Tracking of Selected Cells – Alarm if Outside Permitted Cells

This mode is selected by setting the *Cell Tracking Mode* parameter to 5.

While this mode is active, the unit will continuously check which main cell is currently in use. If it is not among the reference cells, the cell tracking alarm event will be generated.

Tracking of Selected Cells – Alarm if Inside Forbidden Cells

This mode is selected by setting the *Cell Tracking Mode* parameter to 6.

While this mode is active, the unit will continuously check which main cell is currently in use. If it is among the reference cells, the cell tracking alarm event will be generated.

If the *Cell Tracking Alarm Controls GPS* parameter is set to 1, the GPS will be forced on for up to 3 minutes. If a new GPS position can be acquired within that time, the cell tracking alarm event will be repeated.

If the parameter *Alarm Call for Cell Tracking Alarm* parameter has been set to 1, the unit will attempt to make an alarm call after the alarm report has been sent. See **Alarm Call** for more information about alarm calls.

Vibrator activation is supported through the *Vibrator Activation for Cell Tracking Alarm* parameter. See **Vibrator Activation** for more information about vibrator activation.

See **Report Formats** for information about what report formats are supported for cell tracking alarm events.

Parameters	Command Number	Description
CTT	#C1	Cell Tracking Time Delay
CTF	#C1	Cell Tracking Mode
CTG	#C1	Cell Tracking Alarm Controls GPS
VCT	#C11	Vibrator Activation for Cell Tracking Alarm
CCT	#C11	Alarm Call for Cell Tracking Alarm
	#C96	Cell Reference

Geo Fencing

With the GPS, the unit can be configured to generate a *geo fence alarm event*.

Geo Fence Alarm Event

When the *Geo Fence Mode* parameter has been set to 1, the unit will continuously check the GPS position and check if it is within the permitted area.

The permitted area is within the circle defined by the *Geo Fence Reference Position* and *Geo Fence Radius* parameters.

If the unit goes outside the permitted area for a time period defined by the *Geo Fence Delay Time* parameter, a geo fence alarm event will be generated.

The *Geo Fence Reference Position* can be set in two ways; either by explicitly setting the reference position or by using the current position as the reference position.

To use the current position as reference position, the *Geo Fence Reference Position* parameter has to be sent with **SET** as argument.

To set the reference position explicitly, the *Geo Fence Reference Position* parameter has to have an argument of the following form; $\underbrace{DDMM.mmmm}_{Latitude}, N, \underbrace{DDDMM.mmmm}_{Longitude}, E.$

This form is the same used for the coordinate part of the SRT# GPS format.

Parameters	Command Number	Description
GFM	#C31	Geo Fence Mode
GFR	#C31	Geo Fence Radius
GFD	#C31	Geo Fence Delay Time
GFI	#C31	Geo Fence Idle Time
GFU	#C31	Geo Fence Radius Unit
GFP	#C31	Geo Fence Reference Position

SIM Card Change

By keeping track of the last used SIM Card Id, the unit can generate a SIM card change alarm event, when the SIM card is switched.

SIM Card Change Alarm Event

When the SIM Card Change Alarm Number parameter is defined, this alarm event will trigger automatically when a new SIM card is detected.

The alarm report will be sent only to the *SIM Card Change Alarm Number* using the format defined by the *Report Format for SIM Card Change Alarm* parameter.

See **Report Formats** for information about what report formats are supported for SIM card change alarm events.

Parameters	Command Number	Description
SCN	#C16	Report format for SIM Card Change Alarm
	#C97	SIM Card Change Alarm Number

Configuration Change

If the *Master Access Number* is defined, it is possible to enable the configuration change alarm event.

Configuration Change Alarm Event

To enable the configuration change alarm event, the *Configuration Change Alarm Mode* parameter must be set to 1.

When the unit receives configuration commands, it will generate this event, and send an alarm report to the *Master Number* using the report format defined by the Report format for Configuration Change Alarm parameter.

When the *SIM Card Change Alarm Number* parameter is defined, this alarm event will trigger automatically when a new SIM card is detected.

See **Report Formats** for information about what report formats are supported for SIM card change alarm events.

Parameters	Command Number	Description
CCN	#C16	Report format for Configuration Change Alarm
CCA	#C94	Configuration Change Alarm Mode
	#C99	Master Number

Vibrator Activation

Vibrator activation, other than for detection, can be configured to occur after the three stages of alarm reporting; after the alarm report has been sent (If Alarm Acknowledge Mode enabled, also after reception of valid alarm acknowledgement), after an alarm call has been set up, and after the alarm call finish successfully.

Valid values for the vibrator activation parameters are 0 through 7 and are the sum of the values for each of the three options:

1 – Vibrator activation after alarm report sent (If Alarm Acknowledge Mode enabled, also after reception of valid alarm acknowledgement).

2 – Vibrator activation after alarm call finished successfully.

4 – Vibrator activation after alarm call has been set up.

Parameters	Command Number	Description
VPB	#C11	Vibrator mode for pushbutton alarm
VLB	#C11	Vibrator mode for low battery alarm
VCT	#C11	Vibrator mode for Cell tracking alarm
VPS	#C11	Vibrator mode for passivity alarm

Periodic Reporting

The unit can be configured for two types of periodic reporting events; time based and distance based. When both time based and distance based periodic reporting is enabled, whichever type happens first resets the other type. This means that in a scenario of time based reporting every 10 minutes and distance based every kilometre, if the unit moves more than one kilometre before the 10 minutes are up, a distance based periodic report will be sent and the next time based periodic report can occur 10 minutes later. If however the unit moves, for example, only 900 meters in 10 minutes, a time based periodic report will be sent and the next distance based can occur in one kilometre from that point.

Time Based Periodic Event

To enable time based periodic reporting, the *Periodic Report Cycle* parameter must be non-zero. The time configured is in minutes.

Using the *GPRS Report Interval* parameter in conjunction with the *Periodic Report Cycle* parameter it is possible to get time based periodic reports more often than every minute. This parameter controls how many additional time based periodic reports will be sent during one periodic report cycle. These additional reports are only used when sending over GPRS.

If the reporting mode for a receiver is set to be both SMS and UDP/TCP, the *GPRS Report Interval* will be ignored for that receiver.

If the reporting mode for a receiver is set to be UDP/TCP with fallback to SMS in case of transmission failure, such a transmission failure will only ever cause a single SMS to be sent for one periodic report cycle, while the unit will periodically attempt to send over UDP/TCP during the cycle.

See **Report Formats** for information about what report formats are supported for time based periodic events.

Parameters	Command Number	Description
PER	#C1,#C24,#C25	Periodic Report Cycle
GRI	#C1,#C24,#C25	GPRS Report Interval

Distance Based Periodic Event

To enable distance based periodic reporting, set the *Distance Report Enable* parameter to 1. It is also necessary to set the *Distance Report Interval* and *Distance Report Interval Unit* parameters.

The *Distance Report Interval* can be set between 0 and 999, which together with the *Distance Report Interval Unit* sets the maximum interval to 999km or 99.1km in 1k steps or 100m steps.

There is also a *Distance Report Secondary Interval*, which controls how many additional distance reports should be sent when the reports are sent over GPRS.

If the reporting mode for a receiver is set to be both SMS and UDP/TCP, the *Distance Report Secondary Interval* will be ignored for that receiver.

If the reporting mode for a receiver is set to be UDP/TCP with fallback to SMS in case of transmission failure, such a transmission failure will only ever cause a single SMS to be sent for one periodic report cycle, while the unit will periodically attempt to send over UDP/TCP during the cycle.

Using the *Distance Report Length* parameter, the minimum distance between two recorded GPS positions before accumulating the distance travelled can be configured. The default for this parameter has been set to 50m, but can be set as high as 999m. While it is possible to set this distance to 0, it is not recommended as that would mean movements due to GPS precision errors are also accumulated.

Each time the unit wakes up, for any reason, the first valid GPS position will be used as a reference point for the next position that is at least *Distance Report Length* meters away from the reference. Upon accumulating the distance travelled, a new reference point will be set.

To reset the total distance travelled, the *Distance Report Reset* parameter needs to be sent to the unit with a value of 1.

See **Report Formats** for information about what report formats are supported for distance based periodic events.

Parameters	Command Number	Description
DRE	#C30	Distance Report Enable
DRI	#C30	Distance Report Interval
DRM	#C30	Distance Report Secondary Interval
DRU	#C30	Distance Report Interval Unit
DRL	#C30	Distance Report Length
DRR	#C30	Distance Report Reset

Outgoing Call

It is possible to send a command to the unit that tells the unit to set up a voice call to a specified number.

If such a command is received while the unit is already busy with any type of call, that command will be ignored.

If an outgoing call has been set up, the call can be ended either by the remote party hanging up or through the unit in case a call with higher priority needs to be set up. Call button calls and alarm calls have higher priority than outgoing calls.

Incoming Call

If the unit detects an incoming call, it begins by checking if voice access is restricted to certain numbers, and if so, proceeds to checking if calling party's number is in the access list before answering the call. If voice access is unrestricted, the call is either alerted or answered right away depending on *Call Alert Type (CAT)* parameter. If this parameter is not disabled and *Call Button Mode (CBM)* is set to either 1 or 2, incoming call is alerted according to the selected mode until call button is pressed for the duration of call button detection time in order to answer the call.

It is not possible to call the unit if it already has a call going on.

If an incoming call has been set up, the call can be ended either by the remote party hanging up or through the unit in case a call with a higher priority needs to be set up. Call button calls and alarm calls have higher priority than incoming calls.

Alarm Call

If the parameter NCT in #C1 has been set to 1-9, the unit will try to call the numbers defined in #C9 after alarm report has been sent. Each number will be tried in turn, and if no-one has answered any of the attempts, an additional report is sent to indicate that no-one answered. The unit also sends an additional report to indicate that the call was answered, and what number answered the call, after a successful alarm call. The report that is sent to indicate alarm call success is possible to configure to not be sent.

Same alarm events that are available to trigger an outgoing alarm call are also able to be configured to wait for an incoming call and process the received call as an alarm call.

During this period GPRS reporting is not allowed and any active GPRS connection is closed. Any incoming call is answered instantaneously as long as number of the dialler is allowed to access the unit, in other words, it is included in voice access numbers list (#C3).

Parameters	Command Number	Description
CPB	#C11	Enable/Disable alarm calls for pushbutton alarm
CLB	#C11	Enable/Disable alarm calls for low battery alarm
CCT	#C11	Enable/Disable alarm calls for cell tracking alarm
CPS	#C11	Enable/Disable alarm calls for timer alarm (passivity alarm)
NCT	#C1	Number of Call Trials
CTO	#C1	Call Timeout
ACM	#C16	Alarm Call Message

ACK	#C13	DTMF detection and pulse generation
ACT	#C11	Wait Alarm Call Timeout

Status Check Alarm

It is possible to do a basic Status Check Alarm if Call Button is not used for anything else, i.e. the *Call Button Mode* parameter is set to 0. In this case pressing Call Button for 5 seconds will generate a status check alarm. Upon detection of this Status Check Alarm procedure the unit will send an SMS to itself, and/or to a remote user.

When the SMS that the unit sends to itself is received, the unit will beep for three seconds to indicate successful Status Check Alarm.

The remote user will receive an SMS containing basic information on the units GSM reception, battery level, temperature (only if a temperature sensor is attached), GPS status and GPS position.

The numbers for the unit as well as the remote user has to be set using command #C90. The default configuration is for the first number defined to be for the unit and the second number for the remote user, though it is possible to use the parameter TLN in #C91 to make the first number to the remote user and the second number to the unit itself.

Test Alarm

Test alarm is intended to test the pushbutton alarm and verify the communication with the receiving alarm central. Reports are sent to alarm numbers defined in command #C2 or IP addresses defined in command #C20 depending on reporting mode configuration. Due to the report cause code included in the alarm reports, the alarm central will be able to differentiate Test Alarm from an actual push button alarm.

There are two ways of triggering a Test Alarm.

In the first case, the unit must be turned off using the on-off switch. Thereafter, while the push button is kept pressed, the unit must be turned on using the on-off switch. The unit will vibrate first to indicate that it has detected off-to-on switching and thereafter once more to indicate that it has detected that push button is pressed, under the condition that the push button is kept pressed all the time for approximately 10 seconds after the first vibration.

Another way of generating a Test Alarm is to press Alarm Button five times in a row for durations less than the detection time for actual push button alarm. The pauses between the pressings must also have durations less than the detection time for actual push button alarm. This way of generating Test Alarm can be used any time while the unit's operation status is ON. Unit will vibrate to indicate that it has detected Test Alarm In this case as well.

Alarm Acknowledge Mode

With parameter SAR, pushbutton, test, motion sensor, vibration sensor, temperature sensor, passivity, low battery and charger alarms are all enabled for alarm acknowledge mode and respective alarm reports are only sent over SMS regardless of RMC parameter while other reports are still sent in accordance with RMC parameter. In this mode unit must receive a valid acknowledge message in order to ensure that the alarm report is successfully received by remote side. Otherwise it continues to send last unacknowledged alarm report with time intervals defined by the parameter SAT.

Alarm acknowledge mode also requires all time-based periodic reports over SMS to be acknowledged whether they are sent due to SMS fallback or configured to be sent via SMS initially. However, unlike the case with the alarm reports, transmission is terminated although no valid acknowledgement is received after attempting all available SMS numbers.

Alarm Acknowledge Mode can be enabled to operate in two different modes nevertheless alarm reports are always sent via SMS. These modes are mainly intended to alternate the way non-alarm reports are sent.

In Mode 1, reporting mode configuration (RMC) does not apply as usual. Unlike the standard reporting modes utilized by the software, SMS fallback occurs (if configured to occur) after attempting to send a non-alarm report to all IP numbers (provided that at least one defined) and achieving no success. In other words, main concern when sending non-alarm reports is to first attempt reporting to each available IP number (if configured to report over IP) and achieve at least one send success over IP in order not to fallback to SMS reporting.

Mode 2 applies the standard reporting methods for non-alarm reports, according to RMC parameter i.e. exactly as explained in the RMC parameter description.

Time-based periodic reports are always supposed to be acknowledged in both modes - as long as alarm acknowledge mode is enabled.

Parameter Relations (SAR & RMC)

RMC setting does not affect the way the reporting of alarm reports defined for Alarm Acknowledge Mode (test, pushbutton, motion sensor, vibration sensor, temperature sensor, passivity, low battery and charger alarms) regardless of the selected mode. Even in the most exceptional case when RMC is set to 1 (all reports will be sent by TCP or UDP only, no fallback to SMS in case of failure), alarm reports are still sent over SMS. It is not optional to configure reporting method for alarm reports when alarm acknowledge mode is enabled. Below is a flow diagram that illustrates reporting method for alarm reports.
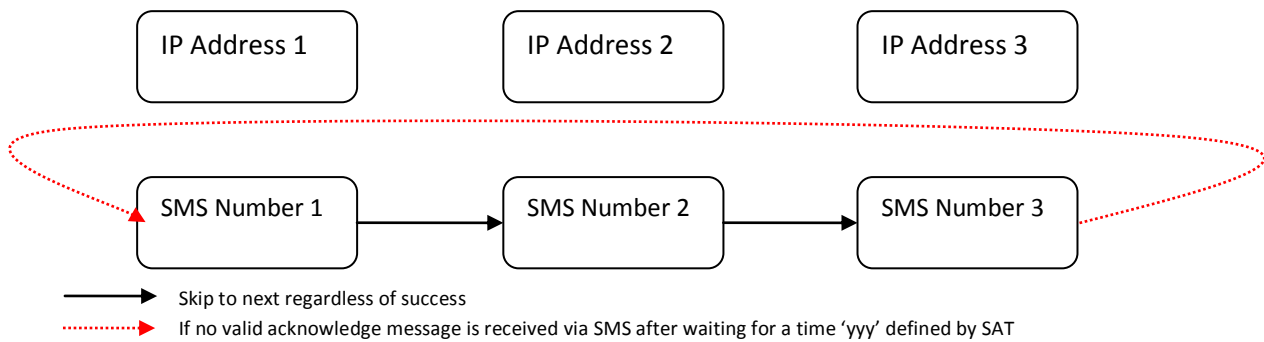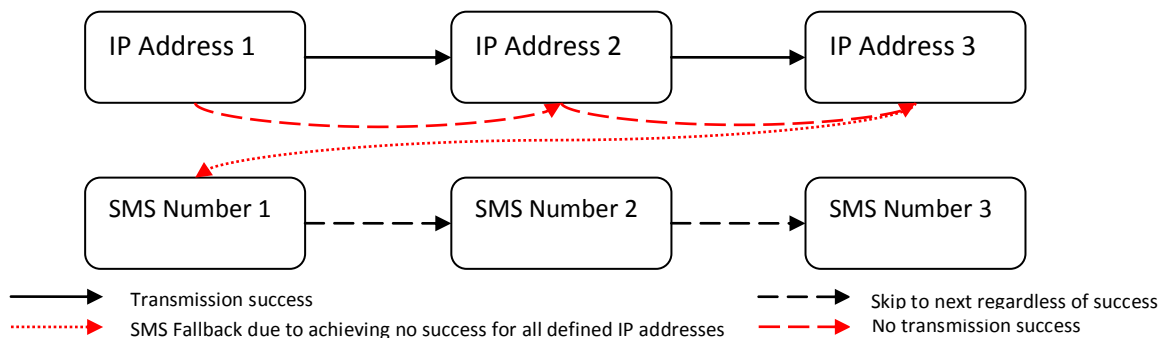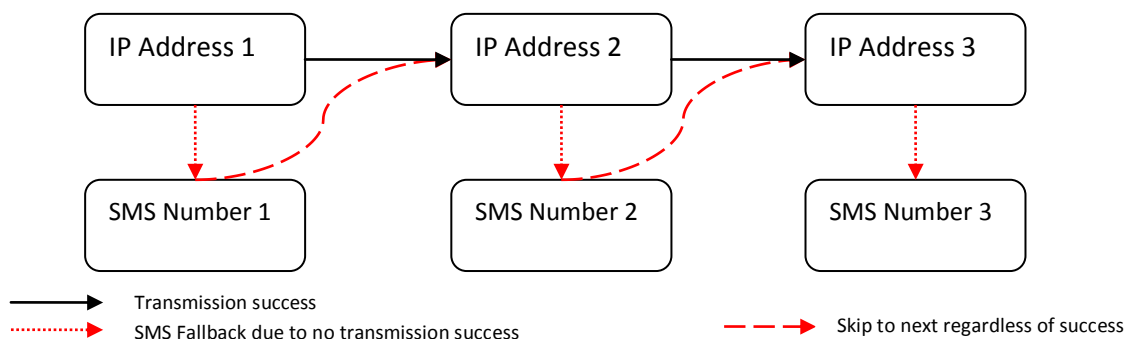
RMC=xxx, SAR>0, SSS=0, Alarm Reports, SAT=yyy

IP Address 1	IP Address 2	IP Address 3

SMS Number 1	SMS Number 2	SMS Number 3

→ Skip to next regardless of success

┈┈▶ If no valid acknowledge message is received via SMS after waiting for a time 'yyy' defined by SAT

Diagram above illustrates the case when all three slots for SMS numbers are filled although there are no restrictions. If any of the SMS number locations is left empty, flow stops sending reports at that location and starts to wait for acknowledge message for the duration of time defined by SAT.

Reporting mode for the rest of the report types are still strictly related to how RMC parameter is configured though in Mode 1, standard reporting methods apply in a different way. Indeed the distinction shows up clearly when RMC parameter is set to 333. Below are two diagrams that illustrate a comparison between how reporting procedure is followed when Mode 1 and Mode 2 is enabled respectively.

RMC=333, SAR=1, SSS=0, Non-Alarm Reports

IP Address 1	IP Address 2	IP Address 3

SMS Number 1	SMS Number 2	SMS Number 3

→ Transmission success   ┄┄▶ Skip to next regardless of success

┈┈▶ SMS Fallback due to achieving no success for all defined IP addresses   ╌╌▶ No transmission success

RMC=333, SAR=2, SSS=0, Non-Alarm Reports

IP Address 1	IP Address 2	IP Address 3

SMS Number 1	SMS Number 2	SMS Number 3

→ Transmission success   ╌╌▶ Skip to next regardless of success

┈┈▶ SMS Fallback due to no transmission success

Diagrams above illustrate the case when all three slots both for SMS numbers and IP addresses are filled although there are no restrictions on how many of the available slots are needed to be filled or filled equally with respect to the other row. For the conditions in the first diagram, if any of the IP address is left empty and SMS fallback occurs and at least one SMS number is defined, flow falls back

to SMS right before that empty slot and attempts to send reports over SMS up to and including last defined SMS number. Furthermore it is also important to note how SMS fallback conditions differ from each other in both cases.

Although number of SMS numbers and IP addresses to be assigned is not restricted in anyway, if an IP number is missing for a location - i.e. more SMS numbers are defined than IP addresses, due to software implementation that location cannot have a RMC value other than 0. Nevertheless as long as Mode 1 is enabled, this case is handled properly as illustrated below:

RMC=330, SAR=1, SSS=0, Non-Alarm Reports
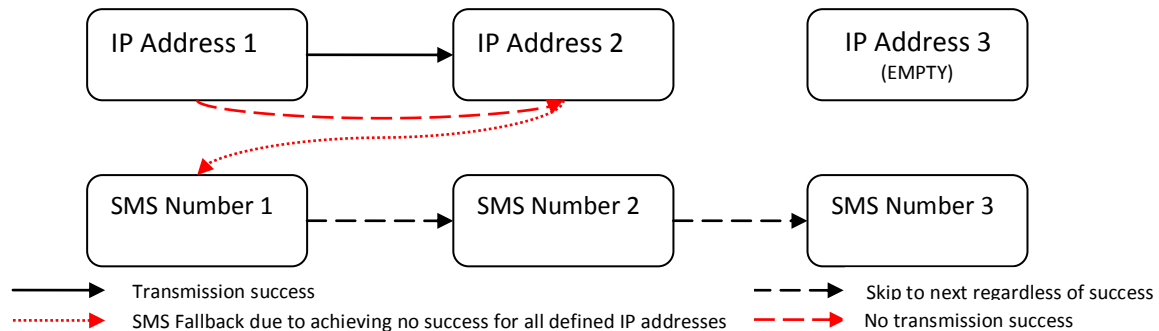
Due to the method that Mode 1 should follow, RMC parameter is not supposed to set with digits different from each other. Such a configuration is not disallowed internally, though it would be inappropriate when the purpose of this mode is considered. Even though this kind of a configuration will not end up with an internal failure, it may lead to unexpected behaviour.

Parameter Relations (SAR & SSS)

SSS parameter is not solely related to Alarm Acknowledge Mode though when SSS and SAR parameters are enabled together unit performs some special operation modes. On the other hand when SSS parameter is enabled alone, it causes to stop sending reports whenever first transmission success is achieved during a report sending flow. This handling of SSS parameter also applies for non-alarm reports when SSS and SAR are both set.

If the parameters SSS and SAR are both set, alarm reports are sent to defined SMS numbers one by one in a looping manner until a valid acknowledge message arrives. Unit waits for a time interval defined by the parameter SAT before each attempt to send alarm report to next number. When a valid acknowledge message is received unit stops sending reports to remaining numbers even if acknowledged report is not sent to these numbers yet. Reporting method for non-alarm reports remains the same except that reporting is also terminated if transmission is successfully carried out against any of the servers before attempting all of them. Below is a diagram that illustrates the reporting flow for alarm reports in this mode.
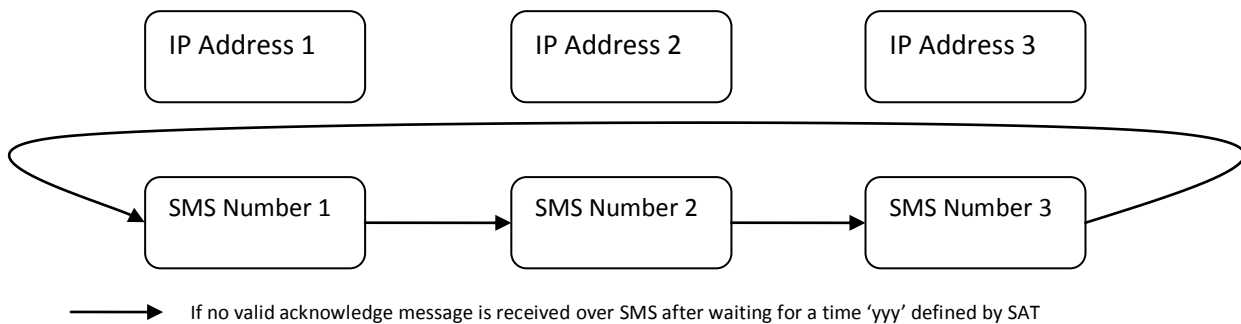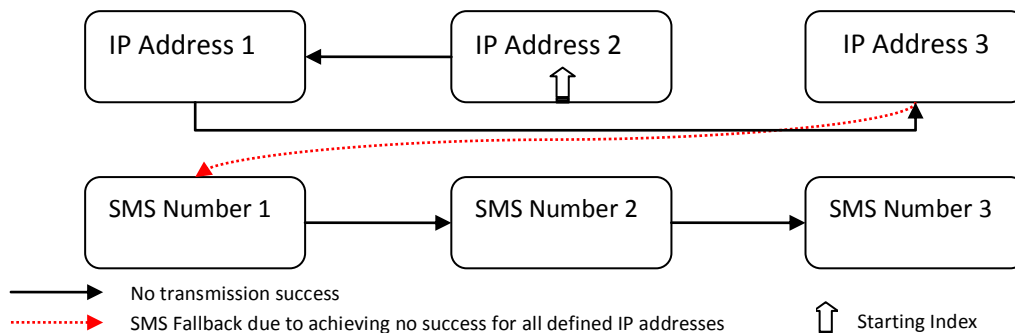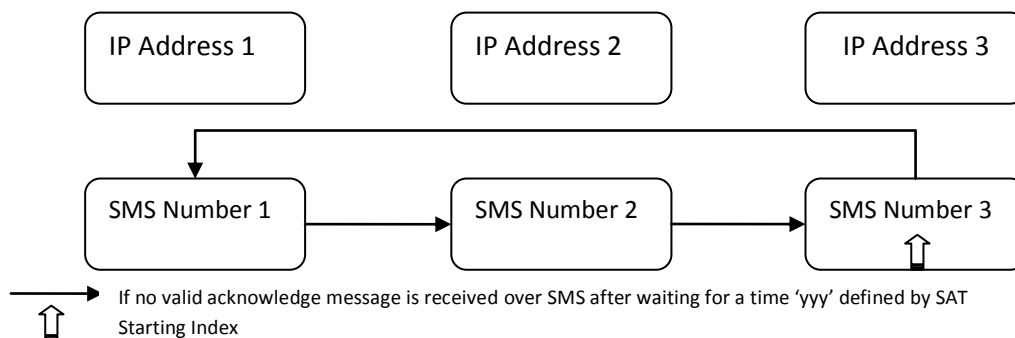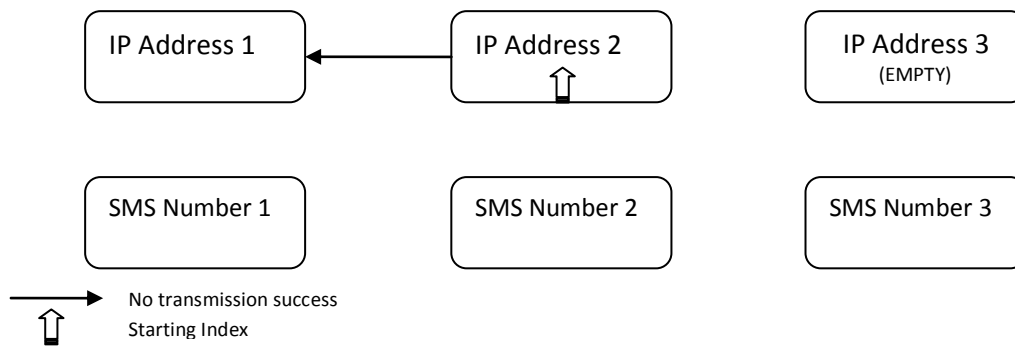
RMC=xxx, SAR>0, SSS=1, Alarm Reports, SAT=yyy

| IP Address 1 | IP Address 2 | IP Address 3 |

| SMS Number 1 | SMS Number 2 | SMS Number 3 |

→ If no valid acknowledge message is received over SMS after waiting for a time 'yyy' defined by SAT
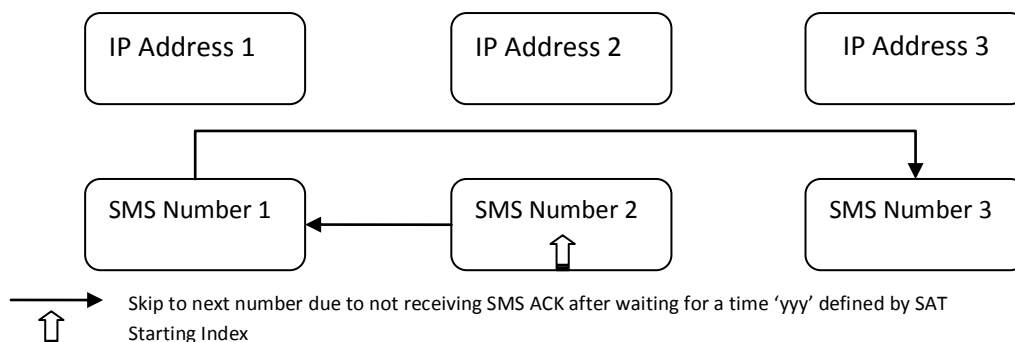
Diagram above illustrates the case when all three slots for SMS numbers are filled although there are no restrictions. If any of SMS number locations is left empty, flow goes back to the beginning as it is the last number in the loop.

Third mode of SSS parameter is an enhanced adaptation of the implementation utilized by the first mode and it is only effective when Alarm Acknowledge Mode is enabled. Third mode utilizes 'active server monitoring' feature which is aimed at reducing overall traffic load over the servers and units, providing a more optimized reporting service. When SSS parameter is set to 3, unit simply keeps track of the SMS server which sends the latest valid acknowledge message for the last alarm report. Since server sending the most recent acknowledge has more potential to be still active all subsequent reports (including both alarm and non-alarm reports) are sent to that server first until a new active server is obtained. For a better notion of this mode, diagrams below demonstrate some cases with varying RMC settings and last obtained active servers.

RMC=333, SAR=1, SSS=3, Non-Alarm Reports, Obtained Server: 2

| IP Address 1 | IP Address 2 | IP Address 3 |

| SMS Number 1 | SMS Number 2 | SMS Number 3 |

→ No transmission success

⋯▶ SMS Fallback due to achieving no success for all defined IP addresses

⇧ Starting Index

RMC=xxx, SAR>0, SSS=3, Alarm Reports, SAT=yyy, Obtained Server: 3

| IP Address 1 | IP Address 2 | IP Address 3 |

| SMS Number 1 | SMS Number 2 | SMS Number 3 |

→ If no valid acknowledge message is received over SMS after waiting for a time 'yyy' defined by SAT

⇧ Starting Index

RMC=110, SAR=1, SSS=3, Non-Alarm Reports, Obtained Server: 2

IP Address 1	←	IP Address 2		IP Address 3 (EMPTY)

| SMS Number 1 | | SMS Number 2 | | SMS Number 3 |

→ No transmission success
⇧ Starting Index

RMC=333, SAR=2, SSS=3, Time-based Periodic Reports, SAT=yyy, Obtained Server: 2

IP Address 1	IP Address 2	IP Address 3
SMS Number 1	SMS Number 2	SMS Number 3

→ Skip to next number due to not receiving SMS ACK after waiting for a time 'yyy' defined by SAT
⋯⋯▶ SMS Fallback due to no transmission success
⇧ Starting Index
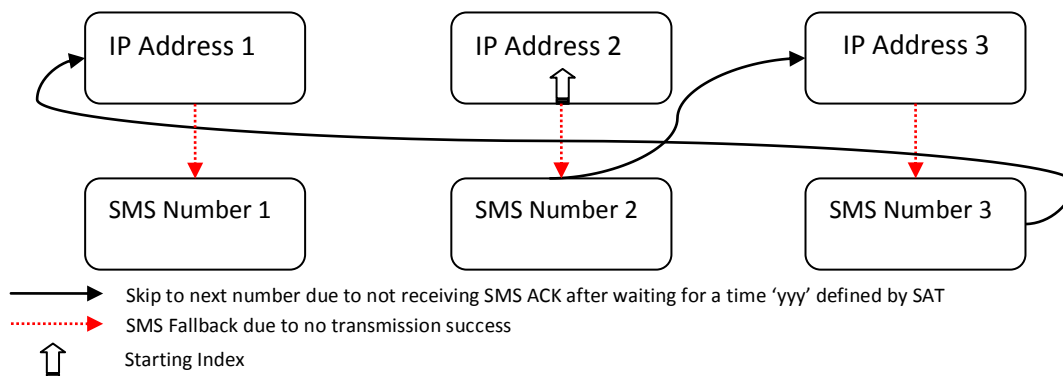
Note that if SSS is not disabled and one of the alarm acknowledge modes is enabled, transmission success for time-based periodic reports via SMS depends on receiving the corresponding SMS acknowledgement. Hence time-based periodic reports differ from rest of the non-alarm reports since successful transmission of SMS to network is sufficient for the rest of the non-alarm reports in order to indicate success. Although time-based periodic reports are similar to alarm reports in that sense, it is essential to consider that periodic report transmission via SMS is terminated even though no valid acknowledgement is received after attempting all available SMS numbers. Consequently, when SSS is disabled since reports are supposed to be sent to all available servers regardless of transmission success, acknowledgements for periodic reports over SMS are not necessarily awaited.

RMC=000, SAR>0, SSS=3, Time-based Periodic Reports, SAT=yyy, Obtained Server: 2

IP Address 1	IP Address 2	IP Address 3
SMS Number 1	SMS Number 2	SMS Number 3

→ Skip to next number due to not receiving SMS ACK after waiting for a time 'yyy' defined by SAT
⇧ Starting Index

Since alarm reports are sent and acknowledged via SMS, there might be a case that latest obtained server's SMS number does not have a corresponding IP address defined. Then flow simply goes back to the first defined IP address and continues with the process as usual. Following is a flow diagram that illustrates such a case where third server replies the last acknowledgement but has no IP address defined:

RMC=330, SAR=1, SSS=3, Non-Alarm Reports, Obtained Server: 3
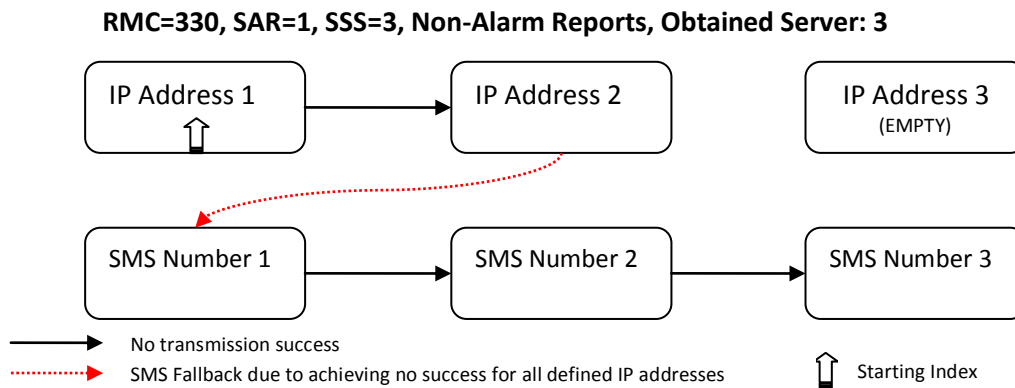
Parameters	Command Number	Description
RMC	#C1, #C24	Reporting Mode Configuration
SAR	#C91	Alarm Acknowledge mode
SSS	#C91	Stop Sending on Success
SAT	#C91	SMS ACK Waiting Time

GSM Registration

When SRT 306 is started, either from idle state or by turning the unit on, the unit will search for a GSM network to register to.

If no network can be found within two minutes of starting up, the unit will enter into a retry mode which includes a full reset of the unit. It is however possible to prevent this reset if a charger is connected and Keep GSM on in case of GSM Registration Failure is configured.

In order to save on battery, it is possible to define the time between registration attempts.

GSM Registration Retry Time

The retry time is defined in minutes using the *GSM Registration Retry Time* parameter in #C1.

Parameters	Command Number	Description
RTT	#C1	GSM Registration Retry Time

Access Control

SRT 306 supports restricting who can send commands or make voice calls to the unit.

SMS Access Numbers

If there are any *SMS Access Numbers* defined, incoming commands will be discarded unless the sender number matches one of these numbers.

There is however one exception to this rule. If the *Master Access Number* has been defined that number will also be able to send commands to the unit.

Because these numbers can also be used as receivers of responses to commands sent to the unit, they should be defined as international numbers including country and area code. For instance, a mobile number of 0709123456 in Sweden should be specified as +46709123456.

Permitted characters are 0-9, A-D, #, * and +.

To configure the *SMS Access Numbers*, use command #C4.

Voice Access Numbers

If there are any *Voice Access Numbers* defined, incoming voice calls will be denied unless the caller id matches one of these numbers.

There is however one exception to this rule; if the *Master Access Number* has been defined, that number will also be able to make voice calls to the unit.

The incoming number information about calling party may vary depending on the country the unit is currently located or the network the caller is attached to. It is therefore recommended that *Voice Access Numbers* are defined without country code and without leading zeros of the area code. For instance, a mobile number of 0709123456 in Sweden should be specified as 709123456. If this is the case, the unit will correctly match this number to the incoming number information even if this information is presented as +46709123456 or 0709123456 or 0046709123456.

Permitted characters are 0-9, A-D, #, *, +.

To configure the *Voice Access Numbers*, use command #C3.

Master Access Number

If the *Master Access Number* is defined, that number will always have access to make configuration changes, request reports and request voice calls to be performed from the unit.

The *Master Access Number* is required for *Configuration Change Alarm* configuration.

When the *Master Access Number* has been defined, a change of the number can only be performed from the defined number. For information about how to specify the number, see **SMS Access Numbers**.

To configure the *Master Access Number*, use command #C99.

Report Formats

All reports support the use of SRT# NMR/GPS, OVLS – Standard, OVLS – B&M, OVLS – B&M Ext and User Defined.

For Pushbutton Alarm Event it is possible to override the report type to use MPTP !EMG instead. However, if User Defined is selected as the normal report type and no message is defined for Pushbutton Alarm Event, no message will be sent to the corresponding receiver.

In the special case when a report is sent as part of a request using #C5 or #C7, it is in the OVLS – Standard and OVLS – B&M cases possible to get a distance report instead of a request message.